

# *Freyana anatina* (Koch, 1844) Feather Mites (Acarina, Freyanoidea) Recorded for the First Time on Wild Ducks (Subfamily, Anatinae) in Turkey

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**SUMMARY:** This study was performed to determine the presence of mite species on wild ducks (Subfamily, Anatinae) in Turkey. For this purpose, a total of 12 ducks were caught in the 2003-2004 hunting seasons and inspected for the presence of mite species. At the end of the examinations six ducks were found to be infested by mites. One mite species was found on the infested ducks. This species were identified as *Freyana anatina* (Koch, 1844). In conclusion, one species of mites not reported before in the mite fauna of Turkey were found.

**Key Words:** Acari, Wild duck, Subfamily Anatinae, *Freyana*, *Freyanoidea*, *Freyana anatina*, Turkey.

## **Türkiye’de Yabani ördekler (Subfamily, Anatinae) Üzerinde İlk Defa Bulunan *Freyana anatina* Koch, 1844 (Acarina, Freyanoidea)**

**ÖZET:** Bu araştırma, Türkiye’de yabani ördeklerde bulunan akar türlerinin belirlenmesi amacıyla yapılmıştır. Bu amaçla, 2003-2004 avlanma mevsimlerinde 12 yabani ördek (Subfamily, Anatinae) yakalanmış ve bunlar akar enfestasyonları yönünden muayene edilmişlerdir. Muayeneler sonucunda altı ördeğin de akarlarla enfeste olduğu saptanmıştır. Enfeste ördeklerde bir akar türü bulunmuştur. Bu tür; *Freyana anatina* (Koch, 1844) olarak teşhis edilmiştir. Sonuç olarak bu çalışmayla, daha önce Türkiye akar faunası içinde bildirilmeyen bir akar türünün varlığı ilk kez ortaya konmuştur.

**Anahtar Sözcükler:** Akar, Yabani ördek, Subfamily Anatinae, *Freyana*, *Freyanoidea*, *Freyana anatina*, Türkiye.

## **INTRODUCTION**

Mites have an important place among the ectoparasites of birds. *Freyana anatina* is a common mite living in flight-feathers. *Freyana anatina*, which is a member of the feather mite group, feeds on feather fragments, lipids, scaly skin debris and fungal spores (PHILIPS, 1990). Some authors’s (Bhattacharyya, 1999; Gaud and Atyeo, 1996; Proctor, 2003; Vasyukova, 1994; Zumpt, 1961) reported that *F. anatina* was found particularly on ducks. No studies could be found about the presence of mite species on domestic and wild ducks in Turkey. To the authors’ knowledge, information about mite species living on birds in Turkey is limited.

Therefore, this study aimed to determine the morphological characteristics of *F. anatina* found on wild ducks and to pre-

sent their microphotographic pictures in order to contribute to the mite fauna of birds in this country.

## **MATERIALS AND METHODS**

For this purpose, a total of twelve ducks were caught in the 2003-2004 hunting seasons and inspected for the presence of mite species. Each duck was brought to the laboratory in a transparent bag and their protocols were noted. In the laboratory, the ducks were flayed. Skin samples were spread over petri dishes placed on a hot plate and kept there for two days. Petri dishes on the plate were examined under a stereomicroscope and the mites were collected. The mites collected were put separately into petri dishes containing of 70% alcohol and each dish was given a protocol number. Then the mites were kept in lactophenol for seven days for the transparenting procedure. Transparented mites were mounted on slides with Canada balsam (Fisher Scientific) and microscopically examined. Some of the mites were identified according to methods described previously (Dabert, 1987; Gaud and Atyeo, 1985).

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## RESULTS

Of the 12 wild ducks examined in the study 6 (50%) were found to have mite infestation. A total of 182 mites belonging to genus *Freyana* were collected from the infested ducks. The mites were identified as *F. anatina*. Of 182 *F. anatina* individuals collected 18 were heteromorphic males, 25 homomorphic males, 87 females, 32 tritonymphs, 14 protonymphs and 6 larvae. This species has two males as a heteromorphic male and a homomorphic male, which have slight morphological differences (Fig 1,3).

The smallest heteromorphic male of this species is 677  $\mu\text{m}$  in length and 441  $\mu\text{m}$  in width and the largest is 688  $\mu\text{m}$  in length and 448  $\mu\text{m}$  in width (Fig 1). Lateral lamellae are well developed and are insertion of setae  $I_4$  extending from both sides of the idiosoma (Fig 1). There is a small trigonal humeral shield on both sides of the body and insertion of setae  $I_1$  (Fig 1). Laterally in the posterior part of hysterosoma are four pairs of setae. These are  $I_4$  which is the outermost setae, next to it is long setae  $I_5$  and a little further away is long setae  $d_5$  having membranous on it. The characteristic external postanal setae (pai) is in the middle (Fig 1). The genital organ is placed at the level of epimera IV. There are three pairs of medial setae around the genital organ, which are  $C_1$ ,  $C_2$  and  $C_3$ . Setae  $C_1$  is placed on sclerites closing the coxal field III. Setae  $C_2$  is in the coxal field IV. Setae  $C_3$  is below the genital organ (Fig 1). Anal slit is placed in the posterior part of the body (Fig 1). The pairs I and II of legs are inserted laterally in the anterior part of the body. The pairs III and IV of legs extend in the ventral side of the body (Fig 1). Femora of I and II are long L-shaped (Fig 1, 2). Genu II similar genu I and on this segment, there is paraxial setae cG dorso-proximally (Fig 2). The nose and dorsal carina of Tibia II is more-developed in comparison to those of tibia I (Fig 3). Solenidion Q is found on the nose of tibia II (Fig 2). The posterior part of the carina dorsally of tibia II is incised (Fig 2). Tarsus II has no dorsal horn (Fig 2). Solenidion  $w_1$  and setae d and f placed on the tarsus II. (Fig 2). Legs III and IV do not resemble legs I and II structurally. There are no setae on femur III and IV. Tibia IV resembles Tibia III. Tibia III is rectangular and extends dorso-ventrally. Tarsus III is triangle in shape without a dorsal horn. Tarsus IV is like Tarsus III, but more elongated (Fig 1). All legs have ambulacra in their ends.

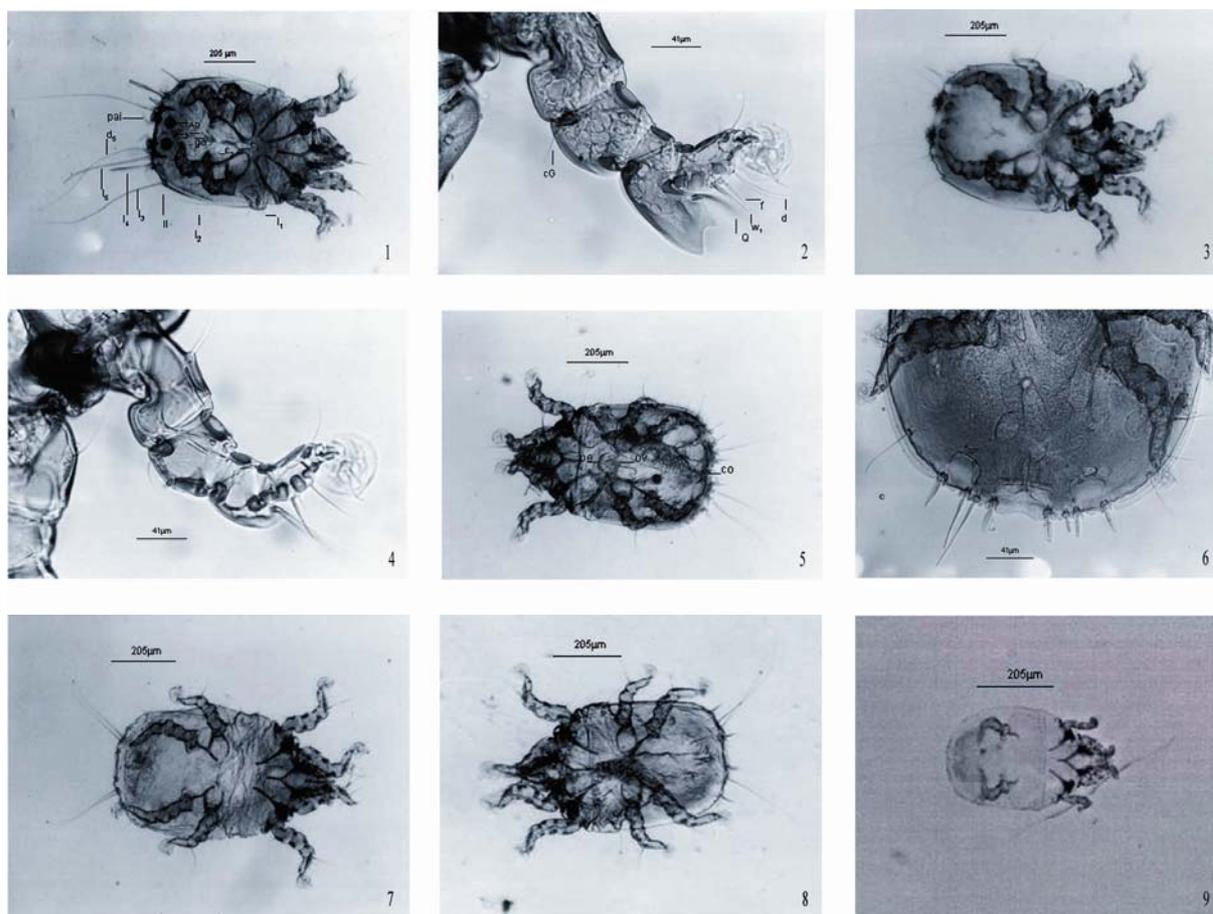
The smallest homomorphic male of this species is 636  $\mu\text{m}$  in length and 410  $\mu\text{m}$  in width and the largest is 716  $\mu\text{m}$  in length and 462  $\mu\text{m}$  in width (Fig 3). Lateral lamellae are narrower than in the heteromorphic male (Fig 3). Humeral shield is under developed (Fig 3). Coxal fields III on the ventral idiosoma are closed, the other opened. Tibia I has no dorsal carina. Tarsus I more slender than in the heteromorphic male (Fig 4). The dorsal carina on tibia II is not incised at the end and is less developed (Fig 4). The smallest female of this species is 574  $\mu\text{m}$  in length and 359  $\mu\text{m}$  in width and the largest

is 711  $\mu\text{m}$  in length and 447  $\mu\text{m}$  in width (Fig 5). Their bodies are more rectangular than males. Their lateral lamellae are narrower (Fig 6) Humeral shield is under developed (Fig 7). All coxal fields on the ventral idiosoma are open. Oviporus is at coxal field III level and has the crescent shaped pregenital apodem slightly over it (Fig 5). Setae pai is spear-shaped (Fig 6). Setae pai,  $I_4$ ,  $I_5$  and  $d_5$  are located on the ventral area and split lingula (Fig 6). Copulatory opening is enclosed by two trigonal processes. Anal slit is in the form of a line (Fig 6). The Legs structures and setae localizations resemble those of the homomorphic male. The smallest tritonymph of this species is 594  $\mu\text{m}$  in length and 359  $\mu\text{m}$  in width and the largest is 645  $\mu\text{m}$  in length and 390  $\mu\text{m}$  in width. Lateral lamellae are very narrow (Fig 7). There is no humeral shield. Setae pai is spear shaped. All coxal fields on ventral idiosoma are open (Fig 7). The smallest protonymph of this species is 533  $\mu\text{m}$  in length and 307  $\mu\text{m}$  in width and the largest is 583  $\mu\text{m}$  in length and 336  $\mu\text{m}$  in width. They do not have humeral shield and lateral lamella (Fig 8). Localization and structure of the setae on hysterosoma posterior resemble those in tritonymph, but the latter is shorter. Setae  $C_1$  and  $C_3$  absent (Fig 8). The smallest larva of this species is 369  $\mu\text{m}$  in length and 236  $\mu\text{m}$  in width and the largest is 490  $\mu\text{m}$  in length and 313  $\mu\text{m}$  in width (Fig 9). It has three pairs of legs. The genital region absent. Setae  $I_4$ ,  $I_5$ , pai,  $C_1$ ,  $C_2$  and  $C_3$  absent (Fig 9).

## DISCUSSION

The presence of mite species on wild and domestic ducks was reported in many countries (Bhattacharyya, 1999; Gaud and Atyeo, 1996; Philips, 1990; Proctor, 2003; Vasyukova, 1994; Zumt, 1961). Dabert (1987) and Gaud and Atyeo (1996) reported that *F. anatina* was found on ducks. However no studies could be found about the presence of mite species on domestic and wild ducks in Turkey. It is seen that the presence of this mite species we identified in wild ducks is consistent with the findings of the above-mentioned researchers.

Dabert (1987) reported that this species had two males as heteromorphic male and homomorphic male and that anal slit was in the posterior median of the body in both males, there were adanal disks on both sides of the anal slit, the lateral lamellae and humeral shield were more developed in the heteromorphic male, relative to the homomorphic male and the female, The trigonal sclerites humeral shield was affixed to setae  $I_1$ , there were four pairs of setae on the posterior lateral of the hysterosoma in both males and females. these setae are setae  $I_4$ , the outermost one, next to it long setae  $I_5$ , a little further from it setae  $d_5$  and external postanal setae pai with the characteristic feature of this species in the middle; genital organ is placed at the level of epimera IV in both males; setae  $C_2$  was located on coxal fields IV with setae  $C_3$  under and setae  $C_1$  over the genital organ, coxal fields III was closed in the homomorphic male, only coxal fields IV was open with all others closed in the heteromorphic male, while all coxal fields were open in



**Figures 1.** Heteromorphic male of *Freyana anatina*, ventral aspects. Setal designation: C<sub>1</sub>-C<sub>3</sub>- central, d<sub>5</sub>- dorsal, h- humeral, I<sub>1</sub>-I<sub>5</sub>- lateral, pai- postanal internal, AD- adanal disc, go- genital organ, II- lateral lamella; **2.** Leg II (Femur, tibia and tarsus ) of *Freyana anatina* heteromorphic male, cG- setae, Q- solenidion, W<sub>1</sub>- solenidion, d and f – setae; **3.** Homomorphic male of *F. anatina*, ventral aspects; **4.** Leg II (Femur, tibia and tarsus) of *F. anatina* homomorphic male; **5.** Female of *F. anatina*, ventral aspects, co- copulatory opening, ov- oviporus, pe- pregenital apodeme; **6.** The posterior part of *F. anatina* female, ventral aspects; **7.** Female tritonymph of *Freyana anatina*, ventral aspects; **8.** Protonymph of *F. anatina*, ventral aspects; **9.** Larva of *F. anatina*, ventral aspects.

the female; leg structures of the homomorphic male and heteromorphic male resembled each other, but nose of Tibia II, which had an important place in distinctive diagnosis was quite well developed in the heteromorphic male. According to the same author's (Dabert, 1987) females resembled homomorphic male structurally with oviporus on coxal area III and a crescent shaped pregenital apodem on it; anal slit was in the form of a line; the legs ended in ambulacrum in all developmental stages; lateral lamellae were very narrow in tritonymph; humeral shield was lacking, there were no lateral lamellae and humeral shield in protonymph, Setae C<sub>1</sub> and C<sub>3</sub> absent, larvae had three legs and genital organs were not formed, setae I<sub>4</sub>, I<sub>5</sub>, pai, a, C<sub>1</sub>, C<sub>2</sub> and C<sub>3</sub> absent. The morphological findings of this study about *F. anatina* found on wild ducks were in agreement with those reported by the above researchers.

In conclusion, one mite species, namely *Freyana anatina* was identified on wild ducks in this study. Since this species were not encountered in the bird mite fauna in Turkey before, It is thought that presentation of the microphotographic pictures of these species might contribute to the mite fauna of wild ducks in Turkey.

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